SUMMARY

The National Park Service (NPS, also "the Park Service" or "Service") proposes to establish new or keep existing quotas (limits) and operating requirements for four types of motorized watercraft – cruise ships, and tour, charter, and private vessels – within Glacier Bay and Dundas Bay in Glacier Bay National Park and Preserve. This draft environmental impact statement (EIS) was prepared, as required, under the National Environmental Policy Act (NEPA) of 1969 and regulations of the Council of Environmental Quality (CEQ; 40 Code of Federal Regulations [CFR] 1500). It describes a reasonable range of alternatives and the existing conditions and contains a detailed analysis of environmental consequences of the alternatives.

PURPOSE AND NEED FOR ACTION

The purpose for the action is to address the continuing demand for motorized watercraft access into Glacier Bay and Dundas Bay in a manner that ensures continuing protection of park resources and values while providing for a range of high-quality recreational opportunities for visitors. The Park Service seeks to develop a system of vessel quotas and operating requirements for the park and preserve that will guide management of vessel traffic in the park.

The need for action stems from legislation enacted in 2001, wherein the U.S. Congress directed the Park Service to set the maximum level of motorized vessel entries based on the analysis in this EIS. Reevaluation of vessel quotas and operating requirements is required to address the continuing demand for vessel entries and park visitation. The Park Service desires, through this planning process and this EIS, to comprehensively address issues and concerns associated with vessel management and the park's marine environment.

THE ALTERNATIVES

Introduction

The National Park Service is considering five alternatives for achieving the objectives and needs described in the previous section. Each alternative defines different entry quotas (limits) and/or operating requirements for cruise ships, tour vessels, charter vessels, and private vessels. Because this environmental impact statement is responding to a very narrow set of needs related specifically to managing commercial and private motorized vessels used for visitor recreational purposes, the alternatives considered have many elements in common.

Alternatives 1, 2, and 3 differ only in the number of vessels permitted to enter Glacier Bay. Alternative 1 would maintain the current quotas (also called the "no-action" alternative). Alternative

2 would decrease vessel quotas from current quotas, setting them at those levels in effect prior to 1996, and alternative 3 (the NPS preferred alternative) is the current quota, plus an allowance for additional cruise ships (totaling up to two per day, every day, from June through August).

Alternative 4 (the environmentally preferred alternative) prescribes vessel quota numbers that were in effect prior to 1985, plus revised operating requirements, while alternative 5 prescribes existing vessel quota numbers with revised operating requirements.

Operating requirements for alternative 4 differ slightly from those in alternative 5, but both alternatives include:

- new restrictions for use of wilderness waters by cruise ships and tour vessels
- increased protection for harbor seal haul-out areas in John Hopkins Inlet (in response to major population declines)
- a revision of designated whale waters to more accurately reflect current whale use

Alternative 1: No Action

Alternative 1 is the no-action alternative. The current quotas and operating requirements for all vessel types would remain in effect under this alternative. Table S-1 lists the specific vessel quotas.

TABLE S-1: SUMMARY OF VESSEL QUOTAS FOR GLACIER BAY UNDER ALTERNATIVE 1, JUNE 1 - AUGUST 31

Vessel Class	Daily Entries	Seasonal Entries	Seasonal-Use Days
Cruise ship[a]	2	139	139
Tour vessel[a]	3	276	276
Charter vessel	6	312	552
Private vessel	25	468	1,971

a. Cruise ships and tour vessels are limited to a maximum of two per day and three per day, respectively, year-round.

Alternative 2

Under alternative 2, Vessel quotas would be those authorized in 1985. Vessel classes would continue to be defined under the existing regulations. Current operating requirements would remain in effect (see table S-2).

TABLE S-2: SUMMARY OF VESSEL QUOTAS FOR GLACIER BAY UNDER ALTERNATIVE 2, JUNE 1 - AUGUST 31

Vessel Class	Daily Entries	Seasonal Entries	Seasonal-Use Days
Cruise ship[a]	2	107	107
Tour vessel[a]	3	276	276
Charter vessel	6	271	511
Private vessel	25	407	1,714

a. Cruise ships and tour vessels are limited to a maximum of two per day and three per day, respectively, year-round.

Alternative 3: NPS Preferred Alternative

Alternative 3 would optimize visitor-use opportunities via cruise ship in Glacier Bay by potentially increasing cruise ship seasonal-use days. This alternative is identical to alternative 1 except that seasonal entry quotas for cruise could increase from 139 to 184 (which would allow for two cruise ships per day every day between June 1 and August 31) contingent upon environmental studies (see table S-3).

TABLE S-3: SUMMARY OF VESSEL QUOTAS FOR GLACIER BAY UNDER ALTERNATIVE 3, JUNE 1 - AUGUST 31

Vessel Class	Daily Entries	Seasonal Entries	Seasonal-Use Days
Cruise ship[a]	2	139 (potentially up to 184)	139 (potentially up to 184
Tour vessel[a]	3	276	276
Charter vessel	6	312	552
Private vessel	25	468	1,971

a. Cruise ships and tour vessels are limited to a maximum of two per day and three per day, respectively, year-round.

Alternative 4: Environmentally Preferred Alternative

Alternative 4 would allow the lowest level of entries across all vessel classes, except private vessels, and would provide revised operating requirements. Tables S-4 and S-5 summarize vessel quotas for Glacier Bay and Dundas Bay respectively, under alternative 4.

TABLE S-4: SUMMARY OF VESSEL QUOTAS FOR GLACIER BAY UNDER ALTERNATIVE 4, MAY 1 – SEPTEMBER 30

Vessel Class	Daily Vessel Quota		Seasonal Entries	Seasonal-Use Days	
	June - Aug	May and Sept	June – Sept	June – Aug	May and Sept
Cruise ship[a]	2	2	NA	92	61
Tour vessel[a]	2	2	NA	184	122
Charter vessel	5	5	NA	460	305
Private vessel	22	22	NA	2,024	1,342

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a. Cruise ships and tour vessels are limited to daily vessel quota year-round.

NA = not applicable

TABLE S-5: SUMMARY OF VESSEL QUOTAS FOR DUNDAS BAY UNDER ALTERNATIVE 4, MAY 1 – SEPTEMBER 30

Vessel Class	Daily Vessel Quota	Seasonal Entries	Seasonal-Use Days
Cruise ship	Not permitted	NA	NA
Tour vessel[a]	Not permitted	NA	NA
Charter vessel[a]	3	NA	459
Private vessel	No limit	No limit	No limit

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a. Cruise ships and tour vessels are limited to daily vessel quota year-round.

NA = Not applicable

Alternative 5

Alternative 5 would maintain the current daily vessel quotas for all vessel types in Glacier Bay. Seasonal-use days for cruise ships would be extended into May and September. Vessel quotas would be initiated for tour and charter vessels in Dundas Bay. Operating requirements would be revised. Tables S-6 and S-7 summarize vessel quotas for Glacier Bay and Dundas Bay, respectively, under alternative 5.

TABLE S-6: SUMMARY OF VESSEL QUOTAS FOR GLACIER BAY UNDER ALTERNATIVE 5, MAY 1- SEPTEMBER 30

Vessel Class	Daily Vessel Quota		Seasonal Entries	Seasonal-Use Days	
	June - Aug	May and Sept		June - Aug	May and Sept
Cruise ship[a]	2	2	NA	139	92
Tour vessel[a]	3	3	NA	276	183
Charter vessel	6	No limit	NA	552	No limit
Private vessel	25	No limit	NA	2,300	No limit

a. Cruise ships and tour vessels are limited to daily vessel quota year-round.

NA = not applicable

TABLE S-7: SUMMARY OF VESSEL QUOTAS FOR DUNDAS BAY UNDER ALTERNATIVE 5, JUNE 1 – AUGUST 31

Vessel Class	Daily Vessel Quota	Seasonal Entries	Seasonal-Use Days
Cruise ship[a]	Not permitted	NA	NA
Tour vessel	0 in upper Bay[a] 1 in lower Bay[b,c]	NA	0 in upper Bay 153 in lower Bay[b,c]
Charter vessel	No limit	NA	276
Private vessel	No limit	No limit	No limit

a. Cruise ships and tour vessels are not allowed on a year-round basis.
b. Upper Dundas Bay is wilderness waters; the lower Bay is non-wilderness waters.
c. The quota season June 1 through August 31 applies.

NA = Not applicable

AFFECTED ENVIRONMENT

The topics addressed in the affected environment section were selected based on federal law, regulations, executive orders, NPS management policies, National Park Service subject-matter expertise, and concerns expressed by other agencies or members of the public during scoping and comment periods.

Physical Environment

Fjord Dynamics and Oceanographic Processes. The most significant physical aspect of Glacier Bay is that it is a recently deglaciated fjord in southeast Alaska. The north end of the Bay's main body divides into two fjord systems known as the East and West Arms. Muir Inlet is included in the East Arm.

Soundscape. The park's soundscape includes both naturally occurring and human-made sounds.

When evaluated against the natural soundscape in a park, human-caused sound is considered "noise". At present, much of the human-generated sounds in the park originate from motorized vessels and, therefore, these sounds are most prevalent over the water, under the water, and along the shoreline.

Air Quality. Air emission sources within the park include exhaust from fuel combustion during vessel operations, fuel combustion for heating of buildings at Bartlett Cove, fuel use by vehicles in the park, and occasional campfires. The greatest source of emissions within the park is marine vessel traffic, and includes nitrogen oxides, sulfur oxides, and particulate matter.

Water Quality. Glacier Bay water quality is affected by a number of factors, including run-off, sedimentation, tidal variations, large-scale mixing and up-welling zones, and the overall complex topography of the area. The consensus among researchers is that water quality in the Bay is generally good. Potential pollution sources in the Bay include motorized vessels, glacial sediment loading, and runoff from developed areas adjacent to the Bay.

Biological Environment

Threatened and Endangered Species. Two species, both marine mammals, are resident seasonally and/or year-round within Glacier Bay and Dundas Bay and are listed as threatened or endangered under the Endangered Species Act. The central north Pacific stock of humpback whales is listed as endangered. The eastern stock of Steller sea lions is listed as threatened. It should be noted that Kittlitz's murrelets are listed as threatened in other parts of the United States and Canada and are under review by the USFW.

Marine Mammals. Marine mammals that inhabit the park seasonally or year round other than the two marine mammals listed as threatened or endangered include: minke whale, harbor porpoise, Dall's porpoise, killer whale, harbor seal, and sea otters.

Marine Birds and Raptors. The bird community of Glacier Bay proper and Dundas Bay is typical of southeastern Alaska. Marine birds (birds that spend most or all of their life near and in marine areas) are the most common type of bird in the planning area and most relevant to this environmental impact statement. Of these, the most sensitive to vessel traffic are colonial nesting seabirds, murrelets, molting waterfowl, raptors, shorebirds, and seaducks.

Marine Fishes. Four pelagic fish species, including capelin, walleye pollock, Pacific herring, and northern lampfish, account for approximately 90 percent of the total number of identified fish in the park. The demersal fishes (bottomfish) found in the park are members of the skates, sculpins, and flatfishes. Five species of salmon and steelhead trout occur in the waters of the park.

Coastal/Shoreline Environments and Biological Communities. Glacier Bay's southern portions have the most beaches; the shorelines in these areas are more mature than the remainder of the Bay. Farther north, the shoreline structure is less mature with fewer beaches and little vegetation. The shoreline vegetation found in the middle and northern portions of the Bay comprises those species that colonize areas after a disturbance. At the terminus of the glaciers, exposed bedrock overlain by fine sediment is prevalent due to the active dumping and grinding by the glacier. The vegetation is sparse and includes hardy pioneer species. Water temperature, salinity, amount of suspended sediment, and ice scour are key factors controlling biological community development and all of these variables are directly related to the proximity of the site to tidewater glaciers. In general, community diversity in rocky intertidal communities close to tidewater glaciers is very low.

Human Environment

Cultural Resources.

Archaeological Resources. Archaeological resources that have been found, or can be expected to occur, in the park are diverse and include: petroglyphs and petrographs, culturally modified trees, rock shelters, villages, forts, fishing sites and weirs, hunting and gathering sites, stone cairn formations, mining camps, canneries, trading posts, log cabins, trails, horticulture sites, buried sites, major/multi-component sites, cemeteries or burials, and intertidal and wet zones.

Ethnographic Resources. A Park Service preliminary assessment of the park has identified approximately 15 sites that may qualify as traditional cultural properties.

Cultural (or Ethnographic) Landscapes. The Park Service has compiled two Cultural Landscapes Inventories in the park at Bartlett Cove and Dundas Bay. Both areas may be eligible for listing in the National Register for Historic Places. They are components of a larger ethnographic landscape that encompasses the entire park and preserve.

Visitor Experience. For this environmental impact statement, five major visitor groups are defined: 1) cruise ship passengers; 2) tour vessel passengers; 3) charter vessel passengers; 4) private vessel visitors; and 5) backcountry visitors. In 2001, nearly 383,000 visitors traveled through Glacier Bay aboard cruise ships, tour vessels, charter vessels or private vessels and other modes. Eighty-five percent of park visitors are cruise ship passengers.

Vessel Use and Safety.

Vessel Traffic. Cruise ships in Glacier Bay generally follow a predictable pattern after they enter the park. Most cruise ships arrive at the mouth of Glacier Bay from the east through Cross Sound and travel north through the Bay. They typically proceed seaward down the West Arm to Glacier Bay. Most vessels continue their outbound voyage down Glacier Bay leaving the park between 4:00 and 8:00 p.m.

Tour, charter, and private vessels are capable of entering remote inlets and harbors within Glacier Bay, although there are typical routing patterns. The primary anchorages for tour, charter, and private boats within Glacier Bay are: North and South Sandy Cove, Blue Mouse Cove, Reid Inlet, Berg Bay, Geikie Inlet, Tidal Inlet, Russell Island Passage, Johnson Cove, Goose Cove, Adams Inlet, Sebree Cove, North and South Fingers Bay, and Beardslee Island Entrance. There is a legislated provision for a daily passenger ferry from Juneau to Bartlett Cove.

Vessel Safety. Since the Vessel Management Plan was implemented in 1996, no cruise ships have been involved in collisions or groundings. A crab boat, fishing in the winter, sank, and one tour vessel has grounded. In a separate incident, another tour vessel struck an iceberg in Tarr Inlet and suffered hull damage. There was no oil spill associated with this incident. Twenty-one other vessels (mostly private vessels) have grounded, but with only minor damage reported. Other types of accidents commonly reported include vessels going adrift or dragging anchor, and minor collisions.

Wilderness Resources. Approximately 2,658,186 acres of Glacier Bay National Park's total of 3,283,168 acres are designated as part of the National Wilderness Preservation System. These wilderness resources include most of the land in the park and five marine wilderness waterways: the Beardslee Islands, Dundas Bay, the Hugh Miller/Scidmore Complex, Adams Inlet, and Rendu Inlet. The Glacier Bay Wilderness offers some of the most unique resources in all of the National Wilderness Preservation System. Calving tidewater glaciers, temperate rainforest, plant diversity, and terrestrial and marine wildlife including threatened and endangered species, provides an unparalleled intact ecosystem.

Local and Regional Socioeconomics. Communities neighboring Glacier Bay National Park include relatively small villages, native communities, and larger towns that rely on tourism, government, and the fishing, forest products, and mining industries as a basis for their economies. The nearest town to the park is Gustavus, and the town's economy is heavily supported by NPS employment, commercial fishing, tourism, and government. Other nearby communities include: Elfin Cove, a vital service center for recreational and commercial marine vessels, supported by commercial fishing and tourism; Hoonah a predominantly Alaska Native community, supported by commercial fishing, timber,

government, and emerging tourism; Pelican, supported by commercial fishing; Haines, a center for commercial fishing, construction, tourism, and government; Yakutat, a predominantly Alaska Native community dependent on commercial fishing, fish processing, sport fishing, and tourism; Juneau, the service, supply, and transportation center for northern southeast Alaska; Skagway, a vital transportation and tourism center, and; Sitka, supported by commercial fishing, tourism, and government.

ENVIRONMENTAL CONSEQUENCES

The environmental impact statement evaluates the environmental consequences of the five alternatives in Glacier Bay and Dundas Bay by considering direct, indirect, and cumulative effects:

- **Direct effects** are those effects that result from the action and occur at the same time and place.
- **Indirect effects** are those reasonably foreseeable effects caused by the action, but that may occur later in time or farther removed in distance from the location of the direct effect.
- **Cumulative effects** can result from individually minor, but collectively significant, actions taking place over a period of time.

Effects Thresholds. Thresholds help establish the basis for understanding the severity and magnitude of the effects. Under each element of the environment, effects thresholds are defined using four categories of significance: *negligible*, *minor*, *moderate*, and *major*. A major effect indicates that the alternative could result in impairment to the existing environment. An impairment is an effect that would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values.

Mitigation Measures. This environmental impact statement also identifies and discusses mitigation measures, which are specific methods for avoiding, minimizing, rectifying, reducing, or compensating for an alternative's adverse effect(s).

An overview of the environmental consequences of the five alternatives for each environmental resource/topic area is provided below.

Physical Environment

Soundscape. Vessel noise would intrude on the natural soundscape on the surface and underwater. Shoreline areas would be subjected to vessel noise, potentially interfering with visitor enjoyment of the natural soundscape. Under current vessel use, vessel noise is prevalent in the underwater

soundscape. One study found that during peak use in August, nearly 70% of sound samples taken contained vessel noise. Overall, vessel noise is considered consistent with park resources and values because motorize vessels have been and will remain a necessary way to provide access to the park. Access for public enjoyment and understanding of park resources is one of the primary purposes of the park.

Under alternative 2, fewer cruise ships, charter, and private vessels would reduce human-caused sounds, particularly along shorelines, where private vessels are more likely to travel. Alternative 3 could allow an increase of up to 184 cruise ships. During the summer, the underwater soundscape would be subjected to four cruise ship passings each day, every day, during summer, as two cruise ships travel up and then down the Bay. Other vessel levels and operating requirements and associated human-caused noise would be the same as alternative 1. Under alternative 4, the East Arm of Glacier Bay and lower Dundas Bay would be improved by limiting charter vessels and eliminating tour vessels. Alternative 4 also reduces cruise ship noise by reducing speeds to 13 knots throughout Glacier Bay and by reducing the number of cruise ship by 33% (an average use of one cruise ship per day). Alternative 5 would also set speed limits for cruise ships at 13 knots. However, under alternative 5 private vessels would increase vessel noise along shorelines and in the more remote places of Glacier Bay.

Air Quality. Under certain weather conditions (calm with a temperature inversion), stack emissions would be visible and could linger for several hours. Under alternative 2, fewer cruise ships would reduce the frequency of haze or stack emissions. Under alternative 3, studies would be need to demonstrate that air quality would not be significantly degraded before increasing cruise ships. A 32% increase in cruise ships would greatly increase the frequency of visible stack emissions. Under alternative 4, speed restrictions on cruise ships and lower vessel numbers would reduce emissions and visible plume events. Closure of the east arm to tour vessels could improve visibility there. As with alternative 4, alternative 5 would include speed restrictions that would reduce air emissions, but visible plumes are still expected to occur under certain weather conditions. Under alternative 5, increased private vessels would increase air emissions near shorelines.

Water Quality. Effects would be minor since water quality impacts from spills would be short-term, localized, and the spill response capability is high. A large spill in ice-filled waters is unlikely, but would be a major effect since spill response would not be possible. The effects under alternative 2 would be not discernable from alternative 1. Effects related to discharge of bilge water and vessel grounding or collision would be incrementally lower due to the reduced number of cruise ships.

Under Alternative 3, should cruise ship numbers be increased, then an associated increase in

inadvertent discharges into the water would occur. The risk of a major accident would increase, but still remain very low. Effects on water quality from alternative 4 would be similar to alternative 1 but, due to the lower vessel numbers, would result in a lower level of discharges. Risks of a large spill in Dundas Bay would be reduced by prohibiting tour vessels in that area. Effects of alternative 5 would be similar to alternative 1.

Biological Environment

Threatened and Endangered Species. Vessel traffic would continue to adversely affect both humpack whale and Steller sea lions. Effects would be at the level of individual and not the population. Humpback whales would continue to be disturbed by the sight and sounds of vessels. Collisions with cruise ships would be rare but, over time, would be unavoidable. Existing regulations to protect whales and sea lions would remain in place. Under alternative 2, fewer cruise ships would lower exposure to noise and risk of collisions. Under alternative 3, increasing cruise ship numbers would increase associated noise exposure and risk of collisions. Under alternative 4, the combination of reducing summer cruise ship numbers and speed would greatly reduce noise exposure and the risk of collision. Humpback whales would still be exposed to vessel noise from private vessels, which would slightly increase. Restrictions in Dundas Bay would benefit whale use there. Alternative 5 also includes speed reductions for cruise ships, which would greatly reduce noise and the risk of collision. Increasing private vessels would increase non-lethal injuries to humpback whales. Such events are expected to be rare but unavoidable.

Marine Mammals. Vessel traffic may contribute to reported declines in harbor seal populations. Effects on minke whales would be similar to those described for humpback whale. Other marine mammals would avoid vessel traffic but would otherwise not be harmed. Effects under alternative 2 would be similar to alternative 1 but would include a slightly decreased chance of distribution shifts or animal collisions due to lower vessel numbers. With alternative 3, disturbance would increase if cruise ship numbers are increased. Still, populations are expected to remain stable. Alternative 4 would result in a much lower frequency of disturbance due to speed limits, vessel reductions, and restrictions at Dundas Bay and the East Arm. Additional protection for harbor seals in Johns Hopkins inlet would reduce effects. Expanding seasonal restrictions would increase protection during early and late summer. Under alternative 5, increasing private boats would increase disturbance to marine mammals. Expanding seasonal restrictions would increase protection during early and late summer.

Marine Birds and Raptors. Vessel traffic in Sitakaday Narrows, Reid Inlet, the East Arm, Dundas Bay, and other areas would continue to disturb murrelets, molting waterfowl, and breeding harlequin ducks. The amount of disturbances would decline slightly under alternative 2. Under alternative 3,

overall effect would be similar to alternative 1, but the amount of disturbances would increase if cruise ship numbers were increased. The reduced vessel traffic of alternative 4 would provide a corresponding reduction in vessel disturbance on marine birds. With the increases in private vessels under alternative 5, disturbance to molting waterfowl, murrelets, and harlequin ducks would increase.

Marine Fishes. Under all alternatives, vessel traffic could displace some fish, but overall, the current level of vessel traffic has not been found to seriously disrupt fish populations.

Coastal/Shoreline Environments and Biological Communities. Effects to shoreline would be minor because current vessel traffic does not cause significant erosion of shorelines. Individual beaches may experience some erosion and sediment suspension from vessel traffic. Effects are similar among all alternatives, with the exception that sediment erosion, re-suspension, or relocation would be slightly greater than current conditions under alternative 5 due to an increase in private vessels.

Human Environment

Cultural Resources. Effects to archaeological and historic resources would be negligible because resources would remain eligible for the National Register of Historic Places. Effects to ethnographic resources would be moderate since the project would potentially affect the integrity of traditional cultural properties. The effects of alternative 2 are not discernable from alternative 1. Under alternative 3, increasing cruise ship numbers to 2 per day, every day, during the summer would eliminate opportunities to undertake traditional activities in the central portions of Glacier Bay without the presence of a cruise ship. Conversely, alternative 4 would increase such opportunities. Effects to cultural landscapes would be moderate under alternative 5 because it would allow more private vessels.

Visitor Experience. Backcountry visitors would be exposed to the sight, sound, and occasionally smells of motorized vessels. Such exposure could lead to potential loss of opportunity to experience solitude. Alternative 2 would cause a major loss in the opportunity for passengers to experience Glacier Bay proper, with a reduction in available cruise ships. Under alternative 3, charter and private vessel passengers and backcountry visitors could experience a loss of opportunities for solitude due to increased cruise ship traffic, but opportunities to visit the park could increase.

Under alternative 4, reduced cruise ship and tour vessel entries would reduce opportunities to visit the park. Under alternative 5, effects would be moderate due to fewer numbers of cruise ships allowed in May and September, but increases in private vessels would detract from wilderness experience for backcountry visitors.

Vessel Use and Safety. Under all alternatives, controls on vessel entry strictly limit the density of vessels in Glacier Bay, but limited congestion would continue to occur at Bartlett Cove and Tarr Inlet. Eliminating tour vessels from Dundas Bay under Alternative 4 would eliminate the current risks associated with operating large vessels in relatively shallow areas. Under both alternatives 4 and 5, formally defining cruise ship routes would reduce the risk of groundings and potential fuel spills. Reducing cruise ship speed would further reduce the currently low risk of accidents.

Wilderness Resources. Effects would be minor for most areas and moderate for concentrated use areas, such as Johns Hopkins and Tarr Inlets, where vessel noise and air pollution would be heightened. Most effects would occur along shorelines. Increasing cruise ships to 184 under alternative 3 during summer would reduce the naturalness of wilderness near the tidewater glaciers, where cruise ships spend most of their time while at Glacier Bay. Reduced vessel numbers under alternative 4 would reduce vessel exposures to wilderness. Reducing cruise ship speed limits would reduce vessel emissions and noise, but would also increase the time cruise ships are within Glacier Bay. Under alternative 5, effects would be similar to alternative 1, but with increased protection to Dundas Bay. As with alternative 4, reducing speed limits would reduce vessel emissions and noise, but would also increase the time cruise ships are within Glacier Bay.

Local and Regional Socioeconomics. Effects to the economies of neighboring communities and Southeast Alaska would be negligible, as would the effects to Glacier Bay-dependant businesses. Alternative 2 would cause some decrease in income and employment for communities with economic linkages to Glacier Bay. In addition, local spending associated with private vessels would be reduced. Alternative 3 would provide additional revenues due to increase in cruise ships; effects on local communities would be negligible with the exception of Gustavus, which would benefit from increased park revenues. Under alternative 4, effects would be minor to moderate due to income and employment decrease related to vessel decreases and reduced local spending associated with private vessels. Moderate effects would be expected for Gustavus where personal income reductions would be expected to be between 5% and 10%. Under alternative 5, effects would be similar to alternative 1; changes to Dundas Bay management could have a minor positive effect on commercial users.